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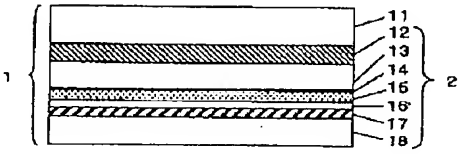
(54) **TRANSFER FOIL CAPABLE OF FORMING LATENT IMAGE AND TRANSFER MEDIUM HAVING LATENT IMAGE**

(57) Abstract:

PROBLEM TO BE SOLVED: To provide a transfer foil and a transfer medium which is made in such a manner that a latent image can be visualized only when being observed through a personal verification medium and, in particular, to provide a transfer foil which is capable of forming latent image in such a manner that a picture which is made latent is clearly recognized when being observed through the verification medium and a transfer medium having the latent image, contrary to the normal condition where no picture other than a picture which is made with printing ink, a hologram picture which is regenerated by the mutual interference of reflection/diffraction beam and, further, a diffraction grating picture, etc., can be observed.

SOLUTION: At least, a protective layer used as a strippable layer in common, a polymer liquid crystal layer capable of forming latent layer, a metallic reflecting layer and an adhesive layer are laminated on a substrate successively and at least the metallic reflecting layer is made to be a two-layer composition of a transparent deposition film and a reflecting film.



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* NOTICES *

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]Although it is [that the picture of a hologram image, a diffraction grating image, etc. which are reproduced by the picture, and the reflection and the diffracted light which consist of printer's ink in the usual state interfering in this invention mutually is only observed, and], When it observes via a verification medium for exclusive use, it is a transfer medium which has the transfer foil and the latent image which enabled it to recognize a latent image, and in which latent image formation is possible.
[0002]
[Description of the Prior Art]From the former, a latent image is provided in a desired portion, and when required, there are various latent image recording media which enabled it to view the latent image. For example, 10,000 line drawings in which it was made for the image latent-image-ized by putting in latent images (secret letter character etc.) using the gap of the pitch of 10,000 lines, and concealing 10,000 line portions with a verification medium to appear, when the latent image was printed with the invisible writing ink into which the filler was put and the latent image part was ground against the pencil, the powder of a pencil adheres to a printing portion, and it hides, and was made for a pattern etc. to appear -- pencil appearance is carried out and it is printed matter (DEKOMATTO) etc. Since the latent image hidden understands that it often observes, these latent image recording media are used as an object for play rather than calling it a full-scale latent image recording medium.
[0003]As a charge of image recording material for recording the latent image in these latent image recording media, there are irreversible thermal coloring ink, the white ink of filler content, reversibility thermal coloring ink, photochromic ink, fluorescent ink, magnetic ink, infrared absorption ink, etc., and it is used with various gestalten.

[0004]Although irreversible thermal coloring ink is ink in which it colors irreversibly by applying heat, it forms a latent image on a substrate by the white of this ink, or a water-white type thing, and uses it as a latent image recording medium. However, in order to display a latent image, a heat source device is required for the latent image recording medium of such composition, and since the picture which moreover indicated by coloring once cannot be decolorized, the use is limited.
[0005]Although it is the white ink which, for example, made the filler harder than metal, such as titanium oxide, contain, the white ink of filler content prints a latent image on white paper in this ink, if required, will carry out the overcoat of the latent image part with varnish of a mat tone, and will use it as a latent image recording medium. Although the latent image recording medium of such composition can display an expected image by grinding the portion of a latent image against coin etc., what can be displayed is a limitation once and the use is limited.
[0006]Reversibility thermal coloring ink (thermochromic ink) is ink colored or decolorized reversibly by applying heat further again.
If heating is stopped and it is neglected for a while, the characteristic of returning to the original state will be used, and it is used as the charge of latent-image-formation material in a latent image recording medium, or a charge of concealing layer formation material for concealing a picture temporarily and latent-image-izing it. However, the latent image recording medium which recorded the latent image in this ink and this ink has tolerance, especially weak heat resistance, and the use is limited.
[0007]Photochromic ink is ink in which it colors by irradiating with light, and the white or water-white type thing is used further again as a charge of latent-image-formation material of a latent image recording medium. However, the latent image recording medium which recorded the latent image in this ink and this ink has

tolerance, especially weak lightfastness, and the use is limited.
[0008]Although fluorescent ink is ink which emits light in fluorescence by irradiating with active light, such as ultraviolet rays, it is the white of this ink, or a water-white type thing, and a latent image may be formed further again. Although luminescence is checked only by the thing of an organic type containing very little organic system fluorescent substances in ink although there is a thing of an organic type and an inorganic type in fluorescent ink, since lightfastness is weak, the use is limited. The thing of an inorganic type needs to put many inorganic system fluorescent substances in ink (about 10 to 20%), and since [its] the existence is also visually known if independent, the latent image formed by this needs to elaborate a design etc.
[0009]Magnetic ink distributes a magnetic particulate in ink further again. What is necessary is to form the magnetic layer which has first the holding power (about 300 or more Oe) in which magnetic recording is possible, and just to make after an appropriate time magnetize a part of this magnetic layer to pattern state, in order to form a latent image using this. And what is necessary is just to make visualization of a latent image stick only to the latent image part which sprinkled iron powder etc. on the magnetic layer and was made to magnetize selectively. However, by this method, the process on which a latent image is displayed is complicated, and rewriting of a picture is possible, and the use is limited.
[0010]Although a picture is formed further again in the ink which absorbs infrared rays and there is a latent image recording medium formed with the material in which infrared rays penetrate the concealing layer for concealing and latent-image-izing this picture after an appropriate time (it prevents from viewing), In order to appear and display this latent image-ized picture currently concealed, an infrared irradiation device, an infrared camera, etc. are required, and it becomes large-scale in device. There is a latent image recording medium which formed the latent image in the ink (IV ink) which is white or colorlessness and has absorption in infrared areas under a visible light exposure, and in order [said] to visualize a latent image similarly, an infrared camera etc. are required also for this.
[0011]The latent image which, on the other hand, comprises the halftone dot and 10,000 lines which changed the pitch or the angle selectively may be formed with usual printer's ink. The bright film which formed the halftone dot or 10,000 lines which were tidily located in a line was piled up so that moire might be generated on this latent image, or visualization of such a latent image of composition was performed by piling up so that it may conceal in 10,000 line portions of the bright film which described above 10,000 line portions other than a latent image. In this case, although the composition of a latent image and a latent image recording medium is easy, and appearance of a latent image and elimination are repeated and can moreover be performed, there is a problem that a complicated-shaped latent image pattern cannot be formed.
[0012]On the other hand, a hologram image, the diffraction grating image, etc. can express a stereoscopic picture and a special decoration image from the former using diffraction and cross protection of light, and the manufacturing method is used all over the parts of a credit card, negotiable securities, and certificates as a forgery prevention means in order to require advanced production technology.
[0013]A hologram is divided into a relief type hologram and a volume type hologram by a manufacturing method. A relief type hologram produces the relief type master hologram which consists of a detailed uneven pattern with an optical photographing method, Furthermore, an uneven pattern is reproduced with an electroplating method after this, the press version made from nickel is produced, after an appropriate time, heating press is carried out on a hologram formation layer, and this press version is manufactured. On the other hand, a volume type hologram records an interference fringe in the volume direction using recording materials, such as a photopolymer. In this type of hologram, generally it is used, and what is called an Lippman-type hologram changes the refractive index of a photopolymer in the volume direction, and makes it a reflection type hologram.
[0014]Two or more very small cells which consist of diffraction gratings are arranged on the diffraction formative layer surface, and a diffraction grating image is formed, It is the spatial frequency of a diffraction grating, the direction of a diffraction grating, and a picture of how for each cell to be located in a line to which make it come to change at least any they are, and is adopted in the field of a card, printed matter, etc. as an effective means of forgery prevention like the hologram mentioned above.
[0015]However, these hologram images and diffraction grating images are effective as a means for forgery prevention, as mentioned above, but. Not the thing formed simply anywhere if needed but the reproduction moreover approximated to the authentic article of an image recording medium which has a hologram and a diffraction grating image by progress of duplicate art these days is obtained increasingly.
[0016]
[Problem(s) to be Solved by the Invention]Although it is [that the picture of the hologram image reproduced by

the picture, and the reflection and the diffracted light which this invention is made in view of the above situations, and consist of printer's ink in the usual state interfering mutually, a diffraction grating image, etc. is only observed, and], When it observes via a verification medium for exclusive use and the picture which is the transfer foil and the transfer medium the latent image enabled it to form and visualize, and was latent-image-ized especially observes via a verification medium, it aims at offer of the transfer medium which has the transfer foil and the latent image which were recognized clearly, and in which latent image formation is possible.

[0017]

[Means for Solving the Problem]This invention was made to achieve the above objects, the invention according to claim 1 laminates at least an exfoliation and protective layer, a polymers liquid crystal layer in which latent image formation is possible, a metallic reflective layer, and a glue line one by one on a substrate, and a metallic reflective layer consists of a transparent vacuum evaporation film and a reflection film at least.

[0018]In transfer foil in which the latent image formation according to claim 1 of the invention according to claim 2 is possible, a diffraction formation structure layer is provided between an exfoliation and protective layer and a polymers liquid crystal layer in which latent image formation is possible.

[0019]The invention according to claim 3 consists of a polymers liquid crystal material in which a polymers liquid crystal layer in which latent image formation is possible has thermotropic nature further again in transfer foil in which the latent image formation according to claim 1 or 2 is possible.

[0020]The invention according to claim 4 consists of a transparent vacuum evaporation film and a reflection film in which a metallic reflective layer consists of metallic materials further again in transfer foil in which the latent image formation according to any one of claims 1 to 3 is possible.

[0021]In transfer foil in which the latent image formation according to any one of claims 1 to 4 is possible, the invention according to claim 5 is characterized by a thing which become a liquid crystal polymer layer in which latent image formation is possible from a polymer material and which has been done for the liquid-crystal-orientation promotion regular placing layer further again.

[0022]In transfer foil in which the latent image formation according to any one of claims 1 to 5 of the invention according to claim 6 is possible, a high refractive index layer which consists of high refraction materials is laminated to a diffraction formation structure layer further again.

[0023]In transfer foil in which the latent image formation according to any one of claims 1 to 5 of the invention according to claim 7 is possible, a glue line makes thermoplastics and an extender a subject at least further again.

[0024]An exfoliation and protective layer, a polymers liquid crystal layer in which latent image formation is possible, a metallic reflective layer, and a glue line laminate the invention according to claim 8 one by one on a substrate at least, and while, further again, Heat-and-pressure transfer of a glue line, a metallic reflective layer, a polymers liquid crystal layer in which latent image formation is possible, and an exfoliation and protective layer of transfer foil in which latent image formation is possible, wherein a metallic reflective layer consists of a transparent vacuum evaporation film and a reflection film at least is carried out in this order, and a latent image is formed in a polymers liquid crystal layer in which latent image formation is possible.

[0025]

[Embodiment of the Invention]Hereafter, the embodiment shown in a drawing explains this invention in detail. Drawing 1 is an outline section explanatory view of the transfer foil 1 in which latent image formation is possible showing an example of an embodiment of the invention. As for the transfer foil 1 in which the latent image formation of this invention is possible, fundamentally, on the substrate 11, it comes at least to laminate the exfoliation and protective layer 12, the polymers liquid crystal layer 15 in which latent image formation is possible, the metallic reflective layer 19, and the glue line 18 in this order, and the metallic reflective layer 19 consists of the transparent vacuum evaporation film 16 and the reflection film 17 at least. In the transfer foil 1 which is shown in drawing 1 and in which latent image formation is possible, the diffraction formation structure layer 13 and the high refractive index layer 14 are further laminated between the exfoliation and protective layer 12 and the polymers liquid crystal layer 15.

[0026]Here the substrate 11 Polyethylene terephthalate, polyvinyl chloride, It consists of a complex etc. which combined suitably what was chosen from films, such as synthetic resins, such as polyester, polycarbonate, poly methyl methacrylate, and polystyrene, and a natural resin, a synthetic paper, paper, thin film glass, or such materials.

[0027]On the other hand, the exfoliation and protective layer 12 on this substrate 11 consists of a mixture of a thermoplastic acrylic resin, chlorinated rubber resin or this chlorinated rubber resin and a nitrocellulose, an

acetyl cellulose, cellulose acetate butylate, polystyrene, or vinyl-chloride-acetate resin, etc. The material which added thermosetting resin, such as melamine resin, an alkyd resin, an epoxy resin, or urea resin, to such materials may constitute. This exfoliation and protective layer is formed by coating such lamination materials with a thickness of 0.1 to 10 micrometers on the substrate 11 using publicly known coating methods, such as the photogravure method and the micro photogravure method.

[0028]As shown in drawing 3, this exfoliation and protective layer 12 is a layer which plays the role which exfoliates and protects the transferred transfer section 2 from the substrate 11 side, when heat-and-pressure transfer is carried out for this transfer foil 1 on the transferred substrate 3 and the transfer medium 4 is obtained, but. When it is hard to separate from the substrate 11, although adhesion with the substrate 11 is good between the substrate 11 and the exfoliation and protective layer 12, adhesion with the exfoliation and protective layer 12 may provide a bad releasing layer further. Like an exfoliation and protective layer, this releasing layer coats what is called a release agent with a thickness of 0.1 to 10 micrometers using publicly known coating methods, such as the photogravure method and the micro photogravure method, and should just provide it.

[0029]On the other hand, the diffraction formation structure layer 13 is formed on the exfoliation and protective layer 12. This diffraction formation structure layer 13 is a layer in which the picture reproduced by the light which it is irradiated with here, and is reflected in it, or is diffracted interfering mutually, i.e., a hologram image, and the diffraction grating image were observed.

[0030]Here, a diffraction grating image is a picture which reflection and the diffracted light when two or more very small cells which consist of diffraction gratings have been arranged, and are constituted and the spatial frequency of a diffraction grating, the direction of a diffraction grating, and the picture achieving portion of arrangement of each cell to which make it come to change at least any they are are irradiated interfere mutually, and is reproduced.

[0031]The diffraction formation structure layer 13 is a layer by which these diffraction grating images and holograms were reproduced as mentioned above, The interference fringe for reproducing a hologram image, a diffraction grating image, etc. and very small unevenness should just form with the material which can be fabricated stably, and the moldability by heat pressing is good, and it is hard to produce press nonuniformity, and consists of material that a bright reconstruction image is acquired. Specifically Thermoplastics, such as polycarbonate resin, polystyrene resin, and polyvinyl chloride resin, They are thermosetting resin, such as unsaturated polyester resin, melamine resin, and an epoxy resin, the ultraviolet rays which have a radical polymerization nature unsaturation group and electron beam hardening resin, or these composite materials.

[0032]On such a diffraction formation structure layer 13, as shown in drawing 1, the high refractive index layer 14 is provided further if needed. This high refractive index layer 14 raises the diffraction efficiency at the time of reproduction of a hologram image or a diffraction grating image, and it establishes it in order to obtain reproduction of a clearer picture, and change of a color.

[0033]This high refractive index layer 14 has a refractive index and a reflection effect higher than the component of the diffraction formation structure layer 13 in which the interference fringe for reproducing a hologram image, a diffraction grating image, etc. and very small unevenness are formed, And the transparency which is a grade which can recognize existence of the lower polymers liquid crystal layer 15 is formed with the material which it has at least.

[0034]specifically, the high refractive index materials and reflection effects from which a refractive index differs, such as TiO_2 and Si_2O_3, SiO, Fe_2O_3, and ZnS, are monolayers about metallic materials, such as higher aluminum, Sn, Cr, nickel, Cu, and Au, -- it is -- it laminates and provides. Although this layer is formed with publicly known methods for forming thin film, such as a vacuum deposition method and sputtering, and that thickness changes with uses, what is necessary is just about 5-1000 nm. As a material which constitutes the high refractive index layer 14 also from other than the above, If it is the material in which the refractive index is higher than the polymer material (refractive index n= 1.3-1.5) used by the diffraction formation structure layer 13, it is usable even if it distributes an inorganic system filler into organic systems other than the above-mentioned inorganic material, organic inorganic composite, and organic system material. What is necessary is just to form with such materials in publicly known coating methods and print processes, such as gravure coating, a die coat, and screen-stencil. If it is the material which has the transparency of a convenient grade when checking the latent image in the polymers liquid crystal layer 15 mentioned later, even if it is materials other than the above, it is possible to use it suitably.

[0035]On the other hand, only when the polymers liquid crystal layer 15 which is formed on the high refractive index layer 14 and in which latent image formation is possible carried out orientation, a latent image is recorded, and can be formed now in a specific direction and a part of the molecular arrangement is observed via a verification medium for exclusive use, it is a layer which enabled it to recognize the latent-image-ized picture.
[0036]This polymers liquid crystal layer 15, for example A polyester copolymer, polyether, What is necessary is to consist of a polymers liquid crystal material which has thermotropic nature, such as polycarbonate, polyisocyanate, and polyglutamic acid ester, and just to form by known stratification means, such as application means, such as printing means, such as gravure and screen printing, and the nozzle coating-machine method.
[0037]The polymers liquid crystal layer 15 which consists of a polymers liquid crystal material etc. in which these thermotropic nature is shown is in the random molecular arrangement state where it does not have a specific crystal structure, in the state where it formed in usual. When heat is selectively applied by thermal head, laser beam, a hot stamper, etc. to the layer of the polymer liquid crystal currently formed in the state of such molecular arrangement and the portion is fused, the orientation of a certain direction will produce into the portion, and the latent image corresponding to a heating section will be formed. Although that existence is not checked as it is, this latent image will come to be recognized if it observes via verification media, such as a polarization film and a polarizing filter.
[0038]The situation at this time is shown in drawing 2. (a) of drawing 2 is a flat-surface explanatory view showing the state of the transfer medium 4 produced by carrying out heat-and-pressure transfer of the transfer section 2 of the transfer foil shown in the transferred substrate 3 at drawing 1 on the transferred substrate 3 as shown in drawing 3, and (b) of drawing 2 is a flat-surface explanatory view showing a state when observing the state at that time with the verification medium 6. As the transfer section 2 transferred on the transferred substrate 3 is shown in (a) of drawing 2, a latent image cannot be checked only by viewing, but the reproduced images 51, such as a hologram image and a diffraction grating image, are only recognized. However, if this latent image part 2 is observed via the verification medium 6 as shown in (b) of drawing 2, the latent-image-ized picture 5 will appear. This portion is a portion which carried out orientation of a part of polymers liquid crystal layer 15 selectively with heat, electrical and electric equipment, magnetic energy, etc.
[0039]In the verification medium 6 used in the case of visualization of a latent image, they are specifically a polarization film, a polarizing filter, etc. Although there are various things, such as polymers polycrystal types which made the PVA oriented film absorb iodo, such as a PVA-iodine type, a dichromatic dye type, metal or a metallic-compounds content type, and a polyene type, in the type of a polarization film or a polarizing filter, What is necessary is just to use it for the portion of a latent image, piling up, as a proper thing is chosen out of these and it is shown in b of drawing 2. Although there is also a circular light film which put a 1/4-wave film on said polarization film in a polarization film, it becomes possible to make a latent image appear easily as a visible image, without being dependent on an observing angle by using this circular light film.
[0040]The metallic reflective layer 19 laminated on the polymers liquid crystal layer 15 of description is a layer for reflecting the irradiation light which has penetrated the polymers liquid crystal layer 15, and consists of the transparent vacuum evaporation film 16 and the reflection film 17 at least.
[0041]The various ceramics which have transparency, for example can be used for the transparent vacuum evaporation film 16. For example, Fe_2O_3, TiO_2, CdS, CeO_2, ZnS, $PdCl_2$, CdO, Sb_2O_3, WO_3, SiO, Si_2O_3, In_2O_3, It forms by Pb0 $_2$ and Ta_2O_3, ZnO, ZrO_2, MgO, SiO_2, MgF_2, CeF_3, CaF_2, AlF_3, aluminum$_2O_3$, GaO, etc.The formation method can use a publicly known technique and can use the chemical gaseous phase depositing methods of thickness, membrane formation speed, the number of laminations, or optical film thickness (=n-d, n:refractive index, d: thickness), such as the physical gaseous phase depositing methods, such as the controllable usual vacuum deposition method and sputtering process, and a CVD method. The thickness is just about 5-1000 nm. When pressurizing and heating the above mentioned polymers liquid crystal layer 15, carrying out orientation of the molecular arrangement of a liquid crystal selectively and forming a latent image by forming this transparent deposition layer 16, it is lost that the distortion accompanying orientation attains to the metallic reflective layer 19 under it, and it becomes possible to consider it as a clear latent image. And the surface state of a transfer section is stabilized and stabilization of the diffraction formation structure layer 13 and sharp reappearance of the hologram image in this diffraction formation structure layer 13 or a diffraction picture are attained.
[0042]Here, the reflection film 17 which constitutes the metallic reflective layer 19 is not limited especially if it has reflexibility, and various metal, an alloy, etc. can be used for it. For example, there are aluminum, Cr, nickel, Cu, Ag, etc. as metal, and there are Pt-Rh, nickel-Cr, etc. as an alloy. This reflecting layer 17 is formed in

publicly known thin film coating technology, such as a vacuum deposition method and sputtering, and should just set thickness to about 5-500 nm.

[0043]On the other hand, the glue line 18 is a layer for carrying out heat-and-pressure transfer of the transfer sections 2 other than substrate 11 of the transfer foil 1 on the transferred substrates 3, such as a card used as a transfer object, and a passbook, at the time of transfer, and pasting up, An extender, rubber system resin, etc. which are adhesion components and a brittle ingredient are formed by a thickness of 1 to 10 micrometers using publicly known coating methods, such as gravure and micro gravure.

[0044]Carry out heat-and-pressure transfer of the glue line at the request portion of a transferred substrate, and it is made to paste up, and the transfer foil concerning this invention in which latent image formation is possible is the above composition, and uses it for it, making a substrate exfoliate after an appropriate time. Thus, drawing 3 shows the state of the obtained transfer medium.

[0045]It is an explanatory view, showing the state of the transfer media 8 and 41 obtained from drawing 4 using the transfer foil 7 and 10 and them which require drawing 7 for other embodiments of this invention, and in which latent image formation is possible on the other hand. The transfer foil 7 and 10 which has these latent images like the transfer foil 1 which has a latent image shown in drawing 1, the polymers liquid crystal layers 25 and 36 in which the exfoliation and protective layers 21 and 31, the diffraction formation structure layers 22 and 32, the high refractive index layers 23 and 33, and latent image formation are possible at least on the substrate 20 and 30, and the metallic reflective layers 53 and 54 -- and it is alike and the glue lines 28 and 39 are laminated in this order. Differing in the transfer foil 1 and the transfer foil 7 is the point that the anchor layers 241 and 242 are formed in the upper and lower sides of the polymers liquid crystal layer 25, respectively. Differing in the transfer foil 1 and the transfer foil 10 is the point that the anchor layer 34 and the liquid-crystal-orientation promotion layer 35 are formed between the high refractive index layer 33 and the polymers liquid crystal layer 36.

[0046]The anchor layers 241, 242, and 34 are formed if needed, in order to paste up firmly the layers which sandwich it. Although thermoplastics is preferred as the component, and simple substances, such as acrylic resin, urethane system resin, epoxy system resin, polyester system resin, and vinyl system resin, or a copolymer is independent or it is usable in these composite materials, it is not necessarily limited to this. What is necessary is just to form an anchor layer by these anchor layer components, for example by known application means, such as gravure, screen printing, and the nozzle coating-machine method, etc.

[0047]The liquid-crystal-orientation promotion layer 35 has heat resistance, and is a layer which consists of polyimide, polyvinyl alcohol, etc., and is a layer provided if needed at the time of the latent image formation in the polymers liquid crystal layer 36 adjoined and provided in this so that molecular arrangement may carry out orientation efficiently.

[0048]Drawing 5 and drawing 7 show the state of the transfer medium produced by carrying out heat-and-pressure transfer of the transfer sections 9 and 40 to the transferred substrates 29 and 42 using the transfer foil 7 and 10 of such composition.

[0049]On the other hand, drawing 8 is the figure which illustrated notionally the optical-path state for three layers, the polarization film 43 when piling up the polarization film 43 on the transfer section of a transfer medium which has a latent image of this invention and observing the latent image in the polymers liquid crystal layer 44, the polymers liquid crystal layer 44, and the metallic reflective layer 45. The white irradiation light 47 irradiated from the light source 46 penetrates the polarization film 43, turns into linear polarization, if it penetrates the polymers liquid crystal layer 44 which has the transparency which gave anisotropy still more nearly selectively to molecular orientation, will change to elliptical polarization and will be reflected by the metallic reflective layer 45. The reflected elliptical polarization penetrates the polarization film 43 again, and returns as the penetration catoptric light 48. Since this penetration catoptric light 48 differs in the intensity of light with wavelength, it can view the picture which has variegated hue. The hue which is in sight also with an angle with the polymers liquid crystal layer 44 by which molecular orientation was carried out to the orientation direction of the polarization film 43 differs.

[0050]

[Example]A concrete example is given and this invention is explained in detail.

[0051]On the PET substrate with a <Example 1> thickness of 16 micrometers, using the exfoliation and protective material ink which consists of presentation] of a following [exfoliation and protective layer, gravure printing was carried out on the drying temperature of 80 **, and the conditions of 1.0 micrometer of coating thickness, and the exfoliation and protective layer was formed. Next, on this exfoliation and protective layer,

using the diffraction formation structural material ink which consists of presentation] of following [diffraction formation structure layer (hologram formation layer), gravure printing was carried out on the drying temperature of 80 **, and the conditions of 0.6 micrometer of coating thickness, and the diffraction mechanism formative layer was formed. By subsequently, the thing which the picture metallic mold made from nickel for which it has a hologram relief pattern is heated at 100 **, and is pressed by the publicly known roll embossing method on the diffraction formation structure layer (hologram formation layer) formed at said process. The relief pattern was formed on the diffraction formation structure layer (hologram formation layer). Then, the high refractive index layer which uses a vacuum deposition method and consists of ZnS of 0.05 micrometer of thickness was formed on the diffraction formation structure layer (hologram formation layer) which formed the relief pattern with the described method. Furthermore, on it, using the thermotropic polymers liquid crystal material ink which consists of presentation] of following [polymers liquid crystal layer, the character handle of "ABC" was formed and it dried with the drying temperature of 60 ** with gravure. The printed film thickness of the character handle was 0.5 micrometer. Next, the transparent vacuum evaporation film which consists of MgF_2 of 200 nm of thickness with a vacuum deposition method was provided on the polymers liquid crystal layer. On it, the reflection film which consists of about 75-nm aluminum with a vacuum deposition method was formed. And using the charge ink of a binder which becomes the last from presentation] of following [glue line, with gravure, the glue line was formed on the drying temperature of 80 **, and the conditions of 2.0 micrometers of coating thickness, and polymer liquid crystal transfer foil was obtained. This polymer liquid crystal transfer foil was piled up on the transferred medium, it transferred in hot stamping on condition of for 120 ** and 0.2 second, having applied it, and the transfer medium which has a latent image was obtained.

[0052]

[A presentation of an exfoliation and protective layer]

Acrylic resin 20 weight sections Methyl ethyl ketone 50 weight sections Toluene 30 weight sections [a presentation of a diffraction formation structure layer]

Polyvinyl chloride acetate copolymer 15 weight-section urethane resin Ten weight sections Methyl ethyl ketone 50 weight sections Toluene 25 weight sections [Presentation of a polymers liquid crystal layer]

Polymer liquid crystal (KIRAKORU PLC-7003: made by Asahi Denka Kogyo K.K.)

20 weight sections Methyl ethyl ketone 80 weight sections [a presentation of a glue line]

Polyester resin Ten weight sections Acrylic resin Ten weight sections Methyl ethyl ketone 40 weight-section toluene 40 weight sections[0053]In the transfer medium which has the transfer foil and the latent image which were acquired, and in which latent image formation is possible, visually, a latent image could not recognize visually at all but only the hologram image appeared. However, the pattern latent-image-ized by putting a polarization film on the transfer medium which has a latent image appeared vividly.

[0054]On the PET substrate with a <Example 2> thickness of 16 micrometers, the exfoliation and protective layer was formed with gravure using the exfoliation and protective material ink which consists of presentation] of a following [exfoliation and protective layer on the drying temperature of 80 **, and the conditions of 1.0 micrometer of coating thickness. Next, the diffraction formation structure layer was formed with gravure on this exfoliation and protective layer using the diffraction formation structural material ink which consists of presentation] of following [diffraction formation structure layer (hologram formation layer) on the drying temperature of 80 **, and the conditions of 0.6 micrometer of coating thickness. Subsequently, the picture metallic mold made from nickel which has a hologram relief pattern was heated at 100 **, and the relief pattern was formed on the diffraction formation structure layer (hologram formation layer) by pressing on a diffraction formation structure layer (hologram formation layer) by the publicly known roll embossing method. The high refractive index layer which uses a vacuum deposition method and consists of TiO_2 of 0.05 micrometer of thickness was formed on the diffraction formation structure layer (hologram formation layer) which formed the relief pattern with the described method. Further again the liquid-crystal-orientation promotion material which consists of presentation] of following [liquid-crystal-orientation promotion layer on it with gravure. To the next which applied on the drying temperature of 80 **, and the conditions of 1.0 micrometer of coating thickness, and formed the liquid-crystal-orientation promotion layer. On this liquid-crystal-orientation promotion layer, using the thermotropic liquid crystal polymeric material ink which consists of presentation] of following [polymers liquid crystal layer, the character handle of "ABC" was formed and it dried with the drying temperature of 100 ** with screen printing. The printed film thickness of the character handle was 1.2 micrometers. Then, the transparent deposition layer which consists of SiO_2 of 300 nm of thickness with a vacuum deposition method was provided

on the above-mentioned polymers liquid crystal layer, and the reflection film which consists of an 80-nm Al film with a vacuum deposition method was provided further. Finally on it, the glue line was formed by gravure printing using the charge ink of a binder which consists of presentation] of following [glue line on the drying temperature of 80 **, and the conditions of 1.0 micrometer of coating thickness, and polymer liquid crystal transfer foil was obtained. This polymer liquid crystal transfer foil was piled up on the transferred medium (paper), it transferred in hot stamping on condition of for 120 ** and 0.2 second, having applied it, and the transfer medium which has a latent image was obtained.

[0055]

[A presentation of an exfoliation and protective layer]

Chlorinated rubber resin 20 weight sections NITORU cellulose Five weight sections Methyl ethyl ketone 50 weight sections Toluene 25 weight sections [a presentation of a diffraction formation structure layer]

Polyvinyl chloride acetate copolymer Ten weight sections Urethane resin 15 weight sections Methyl ethyl ketone 50 weight sections Toluene 25 weight sections [Presentation of a liquid-crystal-orientation promotion layer]

Polyvinyl alcohol Ten weight sections Distilled water 90 weight sections [a presentation of a polymers liquid crystal layer]

Polymer liquid crystal (KIRAKORU PLC-7003: made by Asahi Denka Kogyo K.K.)

40 weight sections Methyl ethyl ketone 30 weight sections Cyclohexanone 30 weight sections [a presentation of a glue line]

Polyester resin 15 weight sections Acrylic resin Five weight sections Methyl ethyl ketone 40 weight sections Toluene 40 weight sections[0056]Visually in the obtained transfer foil in which latent image formation is possible, and the transfer medium which has a latent image, a latent image was not able to recognize visually at all. However, the pattern of "ABC" latent-image-ized by putting a polarization film on the transfer medium which has a latent image appeared vividly.

[0057]On the PET substrate with a <Example 3> thickness of 12 micrometers, the exfoliation and protective layer was formed with gravure using the exfoliation and protective material ink which consists of [a presentation of an exfoliation and protective layer] on the drying temperature of 80 **, and the conditions of 1.0 micrometer of coating thickness. Next, the diffraction mechanism formative layer was formed with gravure on this exfoliation and protective layer using the diffraction formation structural material ink which consists of presentation] of following [diffraction formation structure layer (hologram formation layer) on the drying temperature of 80 **, and the conditions of 0.6 micrometer of coating thickness. Subsequently, the picture metallic mold made from nickel which has a hologram relief pattern was heated at 100 **, and the relief pattern was formed on the diffraction formation structure layer (hologram formation layer) by pressing on a diffraction formation structure layer (hologram formation layer) by the publicly known roll embossing method. The high refractive index layer which uses a vacuum deposition method and consists of ZnS of 0.05 micrometer of thickness was formed on the diffraction formation structure layer (hologram formation layer) which formed the relief pattern with the described method. Then, on it, the anchor layer was formed with gravure using the charge of an anchor material which consists of presentation] of following [anchor layer on the drying temperature of 80 **, and the conditions of 1.0 micrometer of coating thickness. And on it, the liquid-crystal-orientation formative layer was formed with gravure using the liquid-crystal-orientation promotion material which consists of presentation] of following [liquid-crystal-orientation promotion layer on the drying temperature of 80 **, and the conditions of 1.0 micrometer of coating thickness. Next, using the thermotropic polymer material ink which consists of presentation] of following [polymers liquid crystal layer, with gravure, the character handle of "ABC" was formed, and it dried with the drying temperature of 100 **, and was considered as the polymers liquid crystal layer. Printed film thickness was 1.0 micrometer. Furthermore, the reflection film which provides a transparent vacuum evaporation film and consists further MgF_2 of the low refractive index of 150 nm of thickness to **** of about 60-nm Al film with a vacuum deposition method was provided with the vacuum deposition method on the above-mentioned polymers liquid crystal layer. And using the charge ink of a binder which becomes the last from presentation] of following [glue line, with gravure, the glue line was provided on the drying temperature of 80 **, and the conditions of 1.5 micrometers of coating thickness, and polymer liquid crystal transfer foil was obtained. This polymer liquid crystal transfer foil was piled up on the transferred medium (plastic sheet), it transferred in hot stamping on condition of for 120 ** and 0.2 second, having applied it, and the transfer medium which has a latent image was obtained.

[0058]

[A presentation of an exfoliation and protective layer]
Chlorinated rubber resin 20 weight sections **** polyvinyl resin Five weight sections Methyl ethyl ketone 50 weight sections Toluene 25 weight sections [a presentation of a diffraction formation structure layer]
Polyvinyl chloride acetate copolymer 20 weight sections Urethane resin 15 weight sections Methyl ethyl ketone 40 weight sections Toluene 25 weight sections [Presentation of an anchor layer]
Urethane resin 20 weight sections Polyester 15 weight sections Methyl ethyl ketone 40 weight sections Toluene 25 weight sections [Presentation of a liquid-crystal-orientation promotion layer]
Polyimide 15 weight sections Gamma-butyrolactone 65 weight sections Butyl cellosolve 20 weight sections [a presentation of a polymers liquid crystal layer]
Polymer liquid crystal (KIRAKORU PLC-7003: made by Asahi Denka Kogyo K.K.)
20 weight sections Methyl ethyl ketone 50 weight sections Cyclohexanone 30 weight sections [a presentation of a glue line]
Polyester resin Ten weight sections Acrylic resin Ten weight sections Methyl ethyl ketone 40 weight-section toluene 40 weight sections[0059]Visually in the obtained transfer foil in which latent image formation is possible, and the transfer medium which has a latent image, a latent image was not able to recognize visually at all. However, when the polarization film was observed in piles to the transfer medium which has a latent image, the pattern "ABC" appeared vividly.
[0060]On the PET substrate with a <comparative example 1> thickness of 16 micrometers, the exfoliation and protective material ink which consists of presentation] of a following [exfoliation and protective layer was used, and the exfoliation and protective layer was formed with gravure on the drying temperature of 80 **, and the conditions of 1.0 micrometer of coating thickness. Next, on the exfoliation and protective layer, the diffraction formation structural material ink which consists of presentation] of following [diffraction formation structure layer (hologram formation layer) was used, and the diffraction formation structure layer was formed with gravure on the drying temperature of 80 **, and the conditions of 0.6 micrometer of coating thickness. Subsequently, the picture metallic mold made from nickel which has a hologram relief pattern was heated at 100 **, and the relief pattern was formed on the diffraction formation structure layer (hologram formation layer) by pressing on a diffraction formation structure layer (hologram formation layer) by the publicly known roll embossing method. Then, the high refractive index layer which uses a vacuum deposition method and consists of ZnS of 0.05 micrometer of thickness was provided on the diffraction formation structure layer (hologram formation layer) which formed the relief pattern with the described method. And the printed film thickness which used on it the thermotropic polymers liquid crystal material ink which consists of presentation] of following [polymers liquid crystal layer, printed the character handle of "TOPPAN" with gravure, and was dried with the drying temperature of 60 ** was 0.5 micrometer. Next, on it, the reflection film which consists of about 75-nm aluminum with a vacuum deposition method was formed. And the charge ink of a binder which becomes the last from presentation] of following [glue line was used, with gravure, the glue line was formed on the reflecting layer on the drying temperature of 80 **, and the conditions of 2.0 micrometers of coating thickness, and polymer liquid crystal transfer foil was obtained. This polymer liquid crystal transfer foil was piled up on the transferred medium, it transferred in hot stamping on condition of for 120 ** and 0.2 second, having applied it, and the transfer medium which has a latent image was obtained.
[0061]
[A presentation of an exfoliation and protective layer]
Acrylic resin 20 weight sections Methyl ethyl ketone 50 weight sections Toluene 30 weight sections [a presentation of a diffraction formation structure layer]
Polyvinyl chloride acetate copolymer 15 weight sections Urethane resin Ten weight sections Methyl ethyl ketone 50 weight sections Toluene 25 weight sections [Presentation of a polymers liquid crystal layer]
Polymer liquid crystal (KIRAKORU PLC-7003: made by Asahi Denka Kogyo K.K.)
20 weight sections Methyl ethyl ketone 80 weight sections [a presentation of a glue line]
Polyester resin Ten weight sections Acrylic resin Ten weight sections Methyl ethyl ketone 40 weight-section toluene 40 weight sections[0062]Although a latent image could not recognize visually at all visually in the transfer foil or the transfer medium which were obtained, the rough **** cage and the diffraction formation structure layer were destroyed for the surface state, and the effect of the hologram was halved. Even if it piled up the polarization film, a latent image pattern did not appear.
[0063]On the PET substrate with a <comparative example 2> thickness of 16 micrometers, the exfoliation and protective material ink which consists of [a presentation of an exfoliation and protective layer] was used, and

the exfoliation and protective layer was formed with gravure on the drying temperature of 80 **, and the conditions of 1.0 micrometer of coating thickness. Next, on this exfoliation and protective layer, the diffraction formation structural material ink which consists of presentation] of following [diffraction formation structure layer (hologram formation layer) was used, and the diffraction formation structure layer was formed with gravure on the drying temperature of 80 **, and the conditions of 0.6 micrometer of coating thickness. Subsequently, the picture metallic mold made from nickel which has a hologram relief pattern was heated at 100 **, and the relief pattern was formed on the diffraction formation structure layer (hologram formation layer) by pressing on a diffraction formation structure layer (hologram formation layer) by the publicly known roll embossing method. Then, the high refractive index layer which uses a vacuum deposition method and consists of TiO_2 of 0.05 micrometer of thickness was formed on the diffraction formation structure layer (hologram formation layer) which formed the relief pattern with the described method. And on it, the liquid-crystal-orientation promotion material which consists of presentation] of following [liquid-crystal-orientation promotion layer was used, and the liquid-crystal-orientation promotion layer was formed with gravure on the drying temperature of 80 **, and the conditions of 1.0 micrometer of coating thickness. Next, on the liquid-crystal-orientation promotion layer, it screen-stenciled in the thermotropic polymers liquid crystal material ink which consists of presentation] of following [polymers liquid crystal layer, the character handle of "ABC" was formed, and it dried with the drying temperature of 100 **. Printed film thickness was 1.2 micrometers. Then, the reflection film which consists of 80-nm aluminum with a vacuum deposition method was formed on the above-mentioned polymers liquid crystal layer. And in the charge ink of a binder which becomes the last from presentation] of following [glue line, with gravure, the glue line was formed on the polymers liquid crystal layer on the drying temperature of 80 **, and the conditions of 1.0 micrometer of coating thickness, and polymer liquid crystal transfer foil was obtained. This polymer liquid crystal transfer foil was piled up on the transferred medium (paper), it transferred in hot stamping on condition of for 120 ** and 0.2 second, having applied it, and the transfer medium which has a latent image was obtained.

[0064]

[A presentation of an exfoliation and protective layer]

Chlorinated rubber resin 20 weight sections NITORU cellulose Five weight sections Methyl ethyl ketone 50 weight sections Toluene 25 weight sections [a presentation of a diffraction formation structure layer]

Polyvinyl chloride acetate copolymer Ten weight sections Urethane resin 15 weight sections Methyl ethyl ketone 50 weight sections Toluene 25 weight sections [Presentation of a liquid-crystal-orientation promotion layer]

Polyvinyl alcohol Ten weight sections Distilled water 90 weight sections [a presentation of a polymers liquid crystal layer]

Polymer liquid crystal (KIRAKORU PLC-7003: made by Asahi Denka Kogyo K.K.)

40 weight sections Methyl ethyl ketone 30 weight sections Cyclohexanone 30 weight sections [a presentation of a glue line]

Polyester resin 15 weight sections Acrylic resin Five weight sections Methyl ethyl ketone 40 weight sections Toluene 40 weight sections[0065]Although a latent image picture could not recognize visually at all visually in the transfer foil and the transfer medium which were obtained, rough ****** and a diffraction formation structure layer were destroyed for the surface state of hologram transfer foil, and the effect of the hologram was halved. Even if it piled up the polarization film, a latent image pattern did not appear.

[0066]On the PET substrate with a <comparative example 3> thickness of 12 micrometers, the exfoliation and protective material ink which consists of presentation] of a following [exfoliation and protective layer was used, and the exfoliation and protective layer was formed with gravure on the drying temperature of 80 **, and the conditions of 1.0 micrometer of coating thickness. Next, on this exfoliation and protective layer, the diffraction formation structural material ink which consists of presentation] of following [diffraction formation structure layer (hologram formation layer) was applied with gravure on the drying temperature of 80 **, and the conditions of 0.6 micrometer of coating thickness, and the diffraction formation structure layer was formed. Subsequently, the picture metallic mold made from nickel which has a hologram relief pattern was heated at 100 **, and the relief pattern was formed on the diffraction formation structure layer (hologram formation layer) by pressing on a diffraction formation structure layer (hologram formation layer) by the publicly known roll embossing method. And the high refractive index layer which uses a vacuum deposition method and consists of ZnS of 0.05 micrometer of thickness was further formed on the diffraction formation structure layer (hologram formation layer) which formed the relief pattern with the described method. Furthermore, on it, the charge of an anchor material which

consists of presentation] of following [anchor layer was applied with gravure on the drying temperature of 80 **, and the conditions of 1.0 micrometer of coating thickness, and the anchor layer was formed. On this anchor layer, the liquid-crystal-orientation promotion material which consists of presentation] of following [liquid-crystal-orientation promotion layer with gravure. To the next which applied on the drying temperature of 80 **, and the conditions of 1.0 micrometer of coating thickness, and formed the liquid-crystal-orientation promotion layer. On this liquid-crystal-orientation promotion layer, gravure printing was carried out in the thermotropic polymers liquid crystal material ink which consists of presentation] of following [polymers liquid crystal layer, the character handle of "ABC" was formed, and it dried with the drying temperature of 100 **. Printed film thickness was 1.0 micrometer. On the above-mentioned polymers liquid crystal layer, the reflection film which consists of about 60-nm aluminum with a vacuum deposition method was formed further. And the charge ink of a binder which becomes the last from presentation] of following [glue line was applied with gravure on the drying temperature of 80 **, and the conditions of 1.5 micrometers of coating thickness, the glue line was formed, and polymer liquid crystal transfer foil was obtained. This polymer liquid crystal transfer foil was piled up on the transferred medium (plastic sheet), it transferred in hot stamping on condition of for 120 ** and 0.2 second, having applied it, and the transfer medium which has a latent image was obtained.

[0067]

[A presentation of an exfoliation and protective layer]

Chlorinated rubber resin 20 weight sections **** polyvinyl resin Five weight sections Methyl ethyl ketone 50 weight sections Toluene 25 weight sections [a presentation of a diffraction formation structure layer]

Polyvinyl chloride acetate copolymer 20 weight sections Urethane resin 15 weight sections Methyl ethyl ketone 40 weight sections Toluene 25 weight sections [Presentation of an anchor layer]

Urethane resin 20 weight sections Polyester 15 weight sections Methyl ethyl ketone 40 weight sections Toluene 25 weight sections [Presentation of a liquid-crystal-orientation promotion layer]

Polyimide 15 weight sections Gamma-butyrolactone 65 weight sections Butyl cellosolve 20 weight sections [a presentation of a polymers liquid crystal layer]

Polymer liquid crystal (KIRAKORU PLC-7003: made by Asahi Denka Kogyo K.K.)

20 weight sections Methyl ethyl ketone 50 weight sections Cyclohexanone 30 weight sections [a presentation of a glue line]

Polyester resin Ten weight sections Acrylic resin Ten weight sections Methyl ethyl ketone 40 weight-section toluene 40 weight sections[0068]Although a latent image could not recognize visually at all visually in the transfer foil and the transfer medium which were obtained, rough ****** and a diffraction formation structure layer were destroyed for the surface state of hologram transfer foil, and the effect of the hologram was halved. Even if it piled up the polarization film, a clear latent image pattern did not appear.

[0069]

[Effect of the Invention]Since this invention is provided so that the metallic reflective layer provided on a polymers liquid crystal layer may consist of a transparent deposition layer and a reflection film at least and the transparent vacuum evaporation film may moreover touch a polymers liquid crystal layer as stated above, Since a lower metallic reflective layer stops influencing by the partial distortion by orientation when carrying out orientation of the request portion of a polymers liquid crystal layer and establishing a latent image, clear appearance of formation of a very sharp latent image and a latent image-ized picture is attained. And pictures, such as a hologram image of a diffraction formation structure layer and a diffraction picture, come to be clearly recognized in the expected state on a transferred substrate. Effects, like formation of a latent image can be performed simple and the check of a latent image pattern can be performed with a still easier verification method also do so.

[Translation done.]

* NOTICES *

CLAIMS

[Claim(s)]
[Claim 1]Transfer foil in which latent image formation is possible, wherein it laminates at least an exfoliation and protective layer, a polymers liquid crystal layer in which latent image formation is possible, a metallic reflective layer, and a glue line one by one and a metallic reflective layer consists of a transparent vacuum evaporation film and a reflection film at least on a substrate.
[Claim 2]Transfer foil having provided a diffraction formation structure layer between an exfoliation and protective layer and a polymers liquid crystal layer in which latent image formation is possible and in which the latent image formation according to claim 1 is possible.
[Claim 3]Transfer foil in which the latent image formation according to claim 1 or 2 is possible, wherein a polymers liquid crystal layer in which latent image formation is possible consists of a polymers liquid crystal material which has thermotropic nature.
[Claim 4]Transfer foil in which the latent image formation according to any one of claims 1 to 3 is possible, wherein a metallic reflective layer consists of a transparent vacuum evaporation film which consists of metallic materials, and a reflection film.
[Claim 5]Transfer foil having laminated a liquid-crystal-orientation promotion layer which turns into a polymers liquid crystal layer in which latent image formation is possible from a polymer material and in which the latent image formation according to any one of claims 1 to 4 is possible.
[Claim 6]Transfer foil having laminated a high refractive index layer which turns into a diffraction formation structure layer from a high refractive index material and in which the latent image formation according to any one of claims 2 to 5 is possible.
[Claim 7]Transfer foil in which the latent image formation according to any one of claims 1 to 6 is possible, wherein a glue line makes thermoplastics and an extender a subject at least.
[Claim 8]An exfoliation and protective layer, a polymers liquid crystal layer in which latent image formation is possible, a metallic reflective layer, and a glue line laminate one by one on a substrate at least, and while, A glue line of transfer foil in which latent image formation is possible, wherein a metallic reflective layer consists of a transparent vacuum evaporation film and a reflection film at least, A transfer medium which has the latent image carrying out heat-and-pressure transfer of a metallic reflective layer, a polymers liquid crystal layer in which latent image formation is possible, and the exfoliation and protective layer in this order, and having formed a latent image in a polymers liquid crystal layer in which latent image formation is possible.

[Translation done.]

* NOTICES *

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]The section explanatory view showing one embodiment of the transfer foil in which the latent image formation of this invention is possible.
[Drawing 2]The top view explanatory view of a state when observing the transfer medium produced by transferring the transfer section of transfer foil on a transferred substrate, and its state via a verification medium.
[Drawing 3]The section explanatory view of ********** produced by transferring the transfer section of transfer foil on the transferred substrate.
[Drawing 4]The section explanatory view of the transfer foil concerning other embodiments of this invention in which latent image formation is possible.
[Drawing 5]The section explanatory view of the transfer medium which has the latent image acquired by transferring a transfer section to a transferred substrate using the transfer foil which is shown in drawing 4, and in which latent image formation is possible.
[Drawing 6]The section explanatory view of the transfer foil concerning the embodiment of further others of this invention in which latent image formation is possible.
[Drawing 7]The section explanatory view of the transfer medium which has the latent image acquired by transferring a transfer section to a transferred substrate using the transfer foil which is shown in drawing 6, and in which latent image formation is possible.
[Drawing 8]It is the explanatory view which illustrated notionally the optical-path state for three layers, a polarization film when piling up a polarization film on the transfer section of a transfer medium which has a latent image of this invention and observing the latent image in a polymers liquid crystal layer, a polymers liquid crystal layer, and a metallic reflective layer.
[Description of Notations]
1, 7, and 10 Transfer foil in which latent image formation is possible
2, 9, and 40 Transfer section
3, 29, and 42 Transferred substrate
4, 8, and 41 Transfer medium which has a latent image
5 Latent image
6 Verification medium
43 Polarization film
11, 20, and 30 Substrate
12, 21, and 31 Exfoliation and protective layer
13, 22, and 32 Diffraction formation structure layer (hologram formation layer)
14, 23, and 33 High refractive index layer (hologram effect layers)
15, 25, and 36 Polymers liquid crystal layer
16, 26, and 37 Transparent vacuum evaporation film
17, 27, and 38 Reflection film
18, 28, and 39 Glue line
19, 53, and 54 Metallic reflective layer
241, 242, 34 anchor layers
35 Liquid-crystal-orientation promotion layer
46 Light source

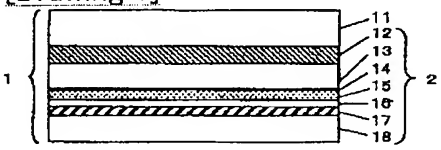
47 White irradiation light
48 Penetration catoptric light

[Translation done.]

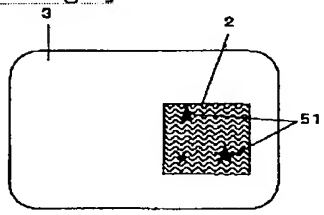
* NOTICES *

DRAWINGS

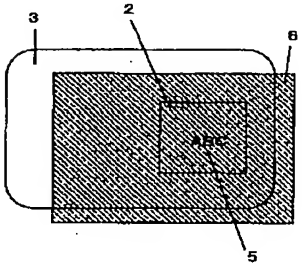
[Drawing 1]



[Drawing 2]

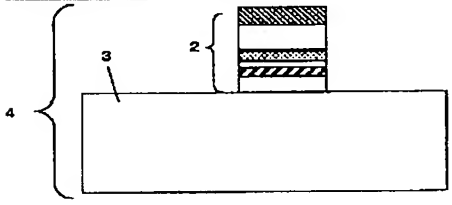


(a)

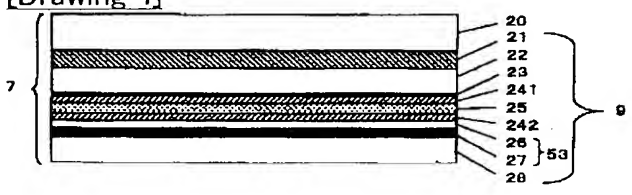


(b)

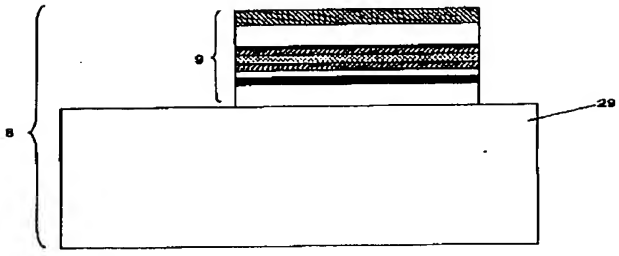
[Drawing 3]



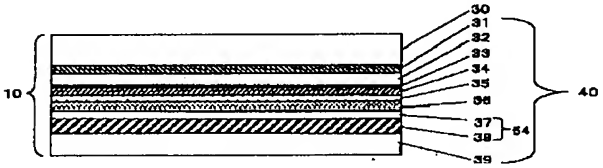
[Drawing 4]



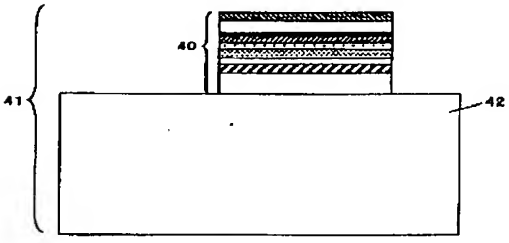
[Drawing 5]



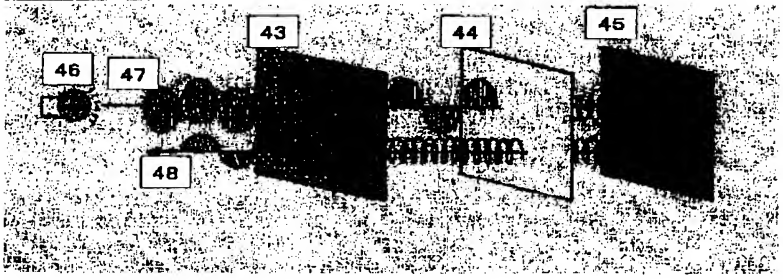
[Drawing 6]



[Drawing 7]



[Drawing 8]



[Translation done.]